

Give exact answers - no calculators

$$\pi = 180^\circ$$

$$\cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$$

$\cos(60^\circ) = \frac{1}{2}$



$$\sin\left(\frac{2\pi}{3}\right) = \frac{\sqrt{3}}{2}$$

$\sin(120^\circ) = \frac{\sqrt{3}}{2}$

$$\cos\left(\frac{\pi}{2}\right) = 0$$

$$\cos(\pi) = -1$$

$$\sin\left(\frac{3\pi}{2}\right) = -1$$



$$\sin\left(\frac{\pi}{6}\right) = \frac{1}{2}$$

$\sin(30^\circ) = \frac{1}{2}$

$$\sin\left(\frac{5\pi}{6}\right) = \frac{1}{2}$$

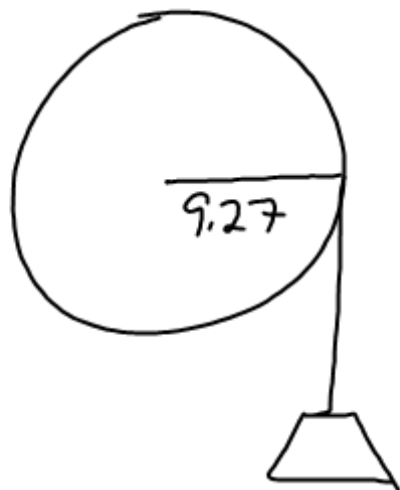
$$\cos\left(\frac{7\pi}{6}\right) = -\frac{\sqrt{3}}{2}$$

$$\cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$$

$$\sin\left(\frac{7\pi}{4}\right) = -\frac{\sqrt{2}}{2}$$



19



$$\frac{71^\circ 50'}{x} = \frac{180^\circ}{\pi}$$

$$x = 1.25$$

$$s = r\theta \rightarrow \text{radians}$$

$$? = 9.27(1.25)$$

$$11.622$$

$$6 = 9.27(\theta)$$

$$\theta = \frac{6}{9.27} = 0.65 \cdot \frac{180^\circ}{\pi} = 37^\circ 5'$$

(21)



$$\begin{aligned}
 s &= \\
 r &= 5.23 \\
 \theta &= 60^\circ = \frac{\pi}{3}
 \end{aligned}
 \rightarrow
 \begin{aligned}
 s &= 5.48 \\
 r &= 8.16 \\
 \theta &=
 \end{aligned}$$

$$s = 5.23 \left( \frac{\pi}{3} \right) \approx \underline{\underline{5.48 \text{ cm}}}$$

Inverse proportions

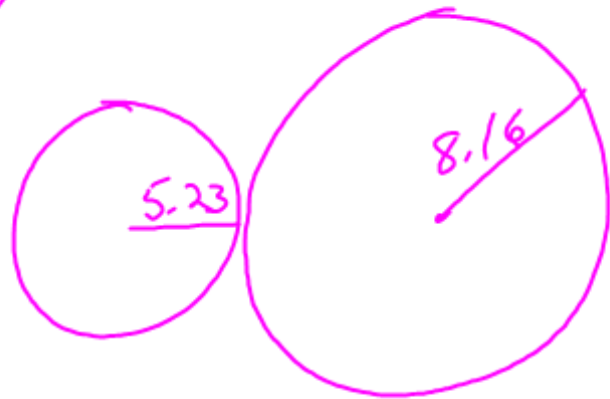
$$\begin{aligned}
 r_s \theta_s &= r_b \theta_b \\
 5.23 \left( \frac{\pi}{3} \right) &= 8.16 (\theta) & \theta &= \frac{5.23 \left( \frac{\pi}{3} \right)}{8.16} \\
 & & \theta &= 0.67
 \end{aligned}$$

$$5.48 = 8.16 \theta$$

$$\theta = 0.67 \text{ radians} \approx 38.5^\circ$$

$$\frac{0.67 \text{ rad}}{x^\circ} = \frac{\pi \text{ rad}}{180^\circ}$$

(21)



$$s = r\theta$$

$$s = 5.23 \left( \frac{\pi}{3} \right)$$

$$\underline{s = 5.48 \text{ cm}}$$

Inverse proportions

$$\rightarrow r_s \cdot \theta_s = r_B \cdot \theta_B$$

$$5.23(60) = 8.16(\theta)$$

$$\theta = 38.5^\circ$$

$$\rightarrow \frac{r_s}{r_B} = \frac{\theta_B}{\theta_s}$$

$$s = r\theta \text{ Big wheel}$$

$$5.48 = 8.16(\theta)$$

$$\theta = 0.67 \text{ rad} \cdot \frac{180}{\pi} = 38.5^\circ$$

(23)

Sm

$$s = 4.72\pi$$

$$r = 1.38$$

$$\theta = 10.75 \text{ rad.}$$

Big

$$s =$$

$$r = 4.72$$

$$\theta = 180^\circ, \pi \text{ rad}$$

$$s = 4.72\pi$$

wheel

$$s =$$

$$r = 13.6$$

$$\theta = 10.75 \text{ rad}$$

$$s = 13.6 \cdot 10.75$$

$$\approx 146 \text{ in} \approx 12'$$

$$s = r\theta$$

$$4.72\pi = 1.38\theta$$

$$\theta = \frac{4.72\pi}{1.38}$$

$$\approx 10.75 \text{ radians}$$

(24)

$$s = r\theta$$

$$s = 55 \text{ miles} \rightarrow \cdot 5280 \text{ ft} \cdot 12 \text{ in} = 3,484,800 \text{ in}$$

$$r = 14 \text{ in}$$

$$\theta =$$

$$3,484,800 = 14\theta$$

$$\theta = 248,914 \text{ radians}$$

$$\text{rotations} = \div (2\pi) \Rightarrow 39,615.9$$

(b)

$$s = ?$$

$$r = 16$$

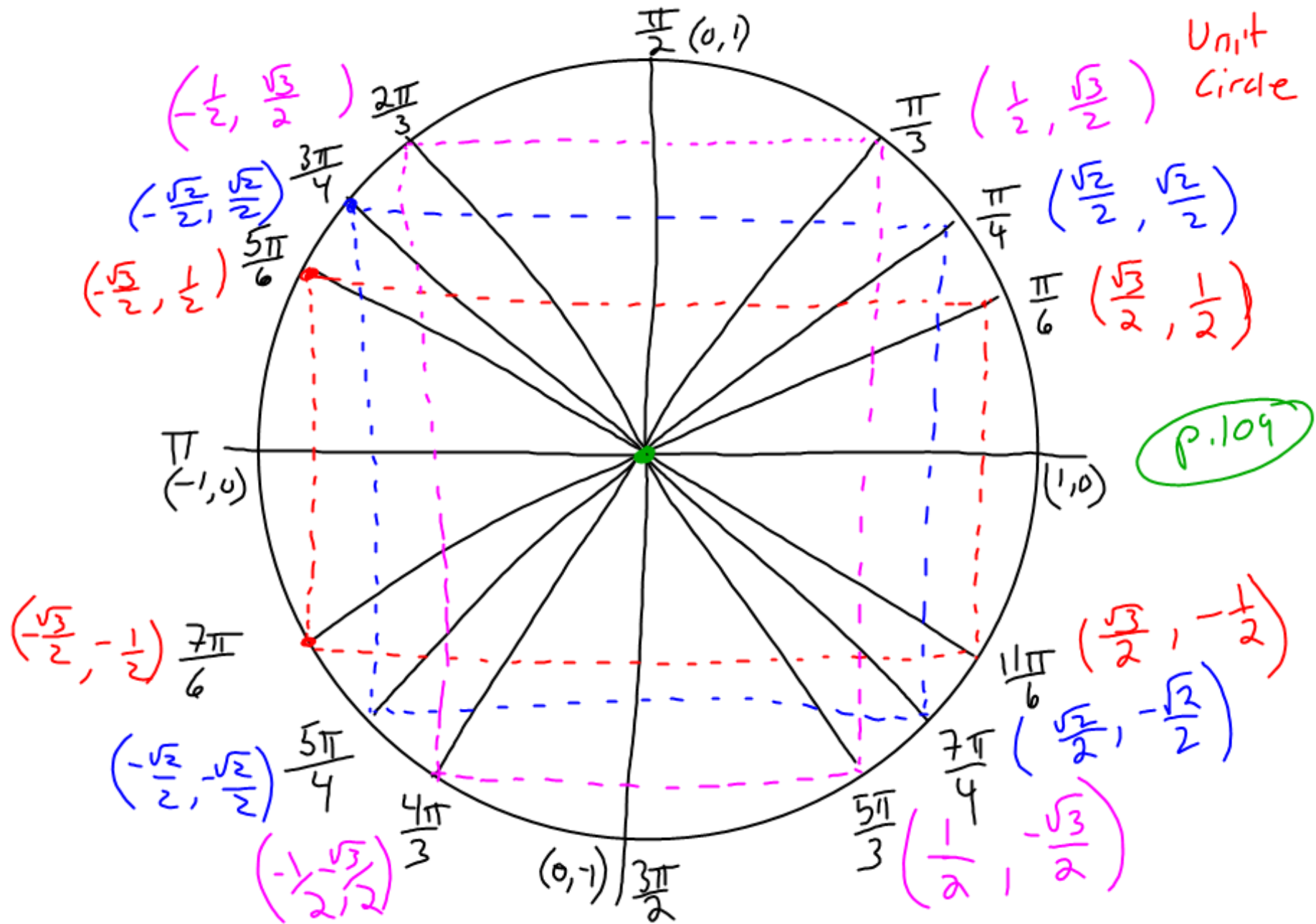
$$\theta = 248,914$$

$$s = 16 \cdot 248,914 = 3,982,624 \text{ in}$$

$$\div 12$$

$$\div 5280$$

$$\approx 62.9 \text{ mph}$$



Sect. 3.3

#1-6, 7-22(4), 23-34(4), 39-44(3), 47, 53, 54,  
55-60(3)